

## AMERICAN PSYLLIDÆ IV

(A Partial Revision of Subfamilies)

D. L. CRAWFORD

For some years students of the family *Psyllidae* have recognized that the classification based upon wing venational characters was more or less superficial. One of the first difficulties encountered in the study of the immense series of species and specimens in the collections at hand was the constant separation into widely distinct artificial groups of two forms really very closely related. The relative length of the cubital petiole and discoidal portion of subcosta in the subfamilies *Aphalarinae* and *Psyllinae* is purely artificial and impossible, even Dr. Franz Low himself including under one or the other subfamily forms which by the diagnostic lines proposed by himself could not possibly be included therein. For instance, in the genus *Aphalara*, typical of the subfamily *Aphalarinae*, are included forms in which the cubital petiole is distinctly shorter than the discoidal portion of subcosta: *Aphalara signata* Low (*Turkestanische Psylloden*, F. Low, p. 254, with figures), and others by Low; *Aph. multipunctata* Kuwajima, and *Aph. fasciata* Kuway., and *Aph. flava* Kuway. (Trans. Sapporo Nat. Hist. Soc. Vol. II, 1907, Figs. 2, 3, 4).

The unmistakable relationship of certain groups of species and genera in spite of previously existing groupings points to the fact that a complete revision and recast of the entire family is most necessary. This is shown very forcibly by the related genera in *Carsidarinae*, formerly known in part as *Prionocnemidae*, and, again, by the new genus *Triozoidea*, one species of which is without a cubital petiole and the other with a very short petiole, but both very clearly congeneric. The same fact is brought out further by the genera of the two subfamilies, *Aphalarinae* and *Psyllinae*. In each of these two groups are genera, which, if the length of the cubital petiole were overlooked, would be unavoidably thrown together into the same genus, or, at least, very closely allied genera.

In this paper the subfamily *Carsidarinae* is presented in as complete form as is possible at this time. The genus *Triozoidea* treated next is presented separately for the time being, since the relationships of the whole family must be considered on the new basis, and this cannot be done until the entire group has been thoroughly studied. The treatment of this genus, however, is given here because of the extremely important evidence which it presents. The genus *Aphalara* is, also, treated as completely as possible now. Access has been had to authentically named specimens of several European species of the genus and the true relationships between these and common American species are here established. The genus is redescribed on a new basis, as are, in fact, all the genera herein presented.

Some confusion has arisen because of several manuscript names which Riley attached to certain species, especially in the *Aphalarinae*; authentic specimens of these are in the C. F. Baker collection from the National Museum, and their present references given here:

*Aphalara angustipennis*.....*Aph. artemisiae angustipennis* Crawford.  
*Aphalara utahensis*.....*Aph. artemisiae* Forst.

<i>Aphalara harrisii</i> .....	<i>Aph. picta</i> Zett.
<i>Aphalara occidentalis</i> ...	<i>Aph. minutissima</i> Crawford.
<i>Aphalara epilobii</i> .....	<i>Aph. nebulosa americana</i> Crawford.

In this paper are mentioned portions of a large number of Psyllidae received from Mr. W. D. Hunter of the Exp. Station at Dallas, Texas, and some, also, from Mr. E. S. Tucker at the same station.

### Carsidarinae

(Syn. *Prionocnemidae* Scott pt., *Ciriacreminae* Enderlein pt.)

The name *Prionocnemidae* was proposed in 1882 by John Scott as a subfamily name for the two genera *Carsidara* and *Tyora*, both of which genera were based principally on the presence of a basal spur on the hind tibiae. This name, of course, cannot stand, for several reasons: the subfamily name must terminate in *inae* and must be derived from the oldest genus in the group, which in this case is *Carsidara*; moreover, the use of the name *Prionocnemidae* is precluded in *Psyllidae* by the existence of a genus in Coleoptera, *Prionocnemus* Kirsch (1874). In 1910 Dr. Enderlein proposed the name *Ciriacreminae* for several genera possessing the post-tibial spur, whether or not they were otherwise related. In the group he includes the genera *Carsidara* and *Tyora* and several other genera not closely allied to these. Regardless of the fact that the group is not closely inter-related, this subfamily name is untenable for the reason that it has been derived from one of the last named genera.

The presence of the basal post-tibial spur is not a character which necessarily relates all species possessing it. In this family there are several species with the armed tibiae which are manifestly not related to each other in any way, except in that one character, and to place all these forms in one subfamily, as done by Enderlein, will result in as much confusion as from grouping genera on wing venation. A species undoubtedly belonging to Enderlein's new and typical genus *Ciriacremum* in the collection at hand is not in the slightest degree related to the several species of *Carsidara* and its allied genera.

The subfamily *Carsidarinae* must, therefore, be recognized as a very homogeneous and closely related group, one characterization of which is the post-tibial spur usually present, and when present, in varying degrees of prominence. The principal diagnostic character of the group is in the thorax and head, with accompanying minor characters of the appendages.

To this subfamily are now referred several genera from the *Aphalarinae*, *Psyllinae* and *Triozinae* which are unmistakably and without the slightest doubt very closely allied to the genus *Carsidara*. This removal of genera from all subfamilies shows that the characters heretofore used for separation of subfamilies in the *Psyllidae* have been only artificial and crude, at best. The primary characters would best be looked for in the thorax first, then the head and then the appendages, the legs and the wings. To use venational characters of the forewing for the subfamily diagnosis is impossible, even when the difference is in the presence or absence of the cubital petiole, and much more so when the difference is a relative one between the lengths of two short veins. It is a remarkable fact that Kuwayama did not discover the relationship of his genera *Tenaphalara*, *Macro-*

*homotoma* and *Mesohomotoma*, both to the genus *Carsidara* and to each other, and that, instead, he placed one in one subfamily and the others in another. The actual relationship of Kuwayama's genera here mentioned cannot be truly ascertained until more is known about the cephalic, thoracic and genital characters. From his meagre descriptions and figures, however, it seems highly probable that his *Mesohomotoma* is congeneric with *Carsidara* Walker, and that all these genera are certainly *Carsidarinae*. Although the genus *Freysuila* Aleman, described by E. A. Schwarz in 1897 (Proc. Ent. Soc. Washington, Vol. IV, p. 196) is said to have no post-tibial spurs, nevertheless the deeply excised and strongly birostrate vertex, the unusually long antennae and the form of the wing place this genus without doubt with the *Carsidarinae*. Mr. Schwarz mentions its similarity to *Homotoma* and *Rhinopsylla*, which probably would indicate that the genus *Homotoma*, also, belongs in this subfamily. Although the genus is unknown to me in nature, I have little doubt but that it should be included with the above mentioned genera, from the descriptions given of it.

It is exceedingly interesting and an unquestionable fact that *Rhinopsylla* and probably *Bactericera* must be removed from *Triozinae* to this subfamily. The striking resemblance to these other genera in the peculiar birostrate appearance of the head and the presence of the post-tibial spur, and other characters of greater importance place all these genera in a remarkably homogeneous supergroup, in spite of venational differences heretofore thought to be primary. It is interesting to note that Riley overlooked the similarity in head structure between his *Rhinopsylla* and *Carsidara* and stated in connection with his description that "the remarkable formation of the head removes *Rhinopsylla* not only from the other genera of this subfamily but from all Psyllidæ hitherto described."

The following table of genera of this subfamily is based chiefly on purely artificial characters since none others are available for the genera not represented in these collections. As soon as further knowledge of these other genera is available the true generic lines can be drawn and synopses made for them. In the interest of the study of this family it is strongly urged that such knowledge may be made available, especially in the form of clear and complete detailed drawings.

#### DESCRIPTION OF SUBFAMILY

Vertex very deeply excised in front at median suture, strongly birostrate. Antennae attached to apex of rostrate lobes; two basal segments very large and long; flagellum usually very long and slender. Facial cones entirely wanting; antennal bases sometimes swollen slightly. Anterior ocellus more or less visible from above, usually on dorsal surface. Labrum small, posterior; rostrum usually very long and slender. Thorax often quite narrow. Propleurites very long; epimeron largely visible. Posterior tibiae usually distinctly spurred at base; spur sometimes more or less reduced. Wings very transparent and shining, usually very distinctly angulate at apex; vein furcation scarcely dichotomous, the branches lateral instead of terminal.

#### TABLE OF GENERA

- A. Cubital petiole wanting; fourth furcal terminating at or near apex of wing. Post-tibial spur small.

- B. Excision of vertex very deep. Third antennal segment slender, or at least distinctly less slender than second.  
*Rhinopsylla* Riley.
- BB. Excision of vertex not so deep. Third antennal segment very long and almost as thick at center as preceding segment.  
*Bacterivora* Puton.
- AA. Cubital petiole distinctly present, variable in length.
- B. Fourth fureal terminating above apex of wing; apex within second marginal cell.
- C. Antennae short; flagellum broadly compressed and densely pubescent. Fourth fureal terminating far above apex of wing.  
*Homotoma* Guer.
- CC. Antennae very long; flagellum very slender; third segment quite thick and densely pubescent. Fourth fureal not far above apex of wing. Posterior tibiae not spurred at base. Anterior ocellus in front.  
*Freyssula* Aleman.
- BB. Fourth fureal terminating below apex of wing; apex between fourth fureal and radius.
- C. Wing broadly rounded at apex; antennae short, very stout, glabrous; rostrum rather short; radius sharply angulated midway. Anterior ocellus in front.  
*Epicarsa* Crawl.
- CC. Wing acutely angulated at apex; rostrum long.
- D. First marginal cell as large as second.
- E. Pterostigma large, broad, short; radius short. Antennae short.  
*Macrohomotoma* Kuway.
- EE. Pterostigma long, narrow; radius long.  
*Tyora* Walker.
- DD. First marginal cell much smaller than second. Pterostigma long, or wanting. Anterior ocellus usually above. Antennae usually long, slender.
- E. Dorsal plate of female genital segment with a prominent convexity near apex and a tuft of long slender hairs thereon. Wings not more than three times as long as broad; fourth fureal strongly curved downward.
- F. Pterostigmal space wanting; radius very short; cubital petiole less than one-third the length of discoidal subcosta.  
*Mesohomotoma* Kuway.
- FF. Pterostigmal space present, open or closed; radius not very short; cubital petiole at least half as long as discoidal subcosta.  
*Carsidara* Walker.
- EE. Dorsal plate of female genital segment without densely pubescent convexity caudad. Wings very slender, more than three times as long as broad; fourth fureal almost straight. Pterostigmal space quite large, open; cubital petiole longer than discoidal subcosta.  
*Tenaphalara* Kuway.

*Carsidara* Walker

Head moderately small; vertex usually sulcately impressed, scarcely plane, strongly birostrate anteriorly; anterior ocellus usually above, upon vertex; posterior ocelli anterior. Antennae large basally; flagellum very long and slender. Labrum small, posterior; rostrum very long, slender and acute.

Thorax usually quite narrow. Post-tibial spur large, prominent. Wing shining, hyaline, quite acutely angulate at apex; vein foreation scarcely dichotomous, lateral.

*Type of genus:* *Carsidara marginalis* Walker.

*Carsidara concolor* n. sp.

(Figure 157, A; 158, C; 159, A; 160, D)

Length of body 2.4 mm.; length of forewing 2.9 mm.; greatest width 1.0 mm.; width of vertex between eyes .40 mm.; with eyes .78 mm. General color light green, somewhat flocculent.

Head not deflexed, with eyes about as broad as thorax, finely punctate; dorsoventral width of profile greater than length through central axis of eye. Occipital margin arcuate; discal areas on each side of median suture with a long, oblique, sulcate impression between posterior and anterior ocelli, and a smaller impression near anterior ocellus; posterior ocellar regions not greatly elevated; vertex very deeply emarginate and excised at median suture anteriorly, strongly birostrate. Anterior ocellus near apex of excision, but not on it, quite large, distinct. Antennae attached to rostrate lobes of vertex; basal segments very large; flagellum extremely long and slender, filiform; third segment much longer than fourth. Facial cones wanting; antennal bases scarcely swollen. Genae prominent. Labrum small, posterior; rostrum very long and slender. Eyes large, quite strongly bulging.

Thorax rather narrow, finely punctate. Pronotum rather long relatively; propleurites very long and prominent; pleural suture curved, attaining almost to lower margin of dorsulum; forecoxae large, mostly visible. Dorsulum quite short, narrow. Metasternal spurs moderately long. Post-tibial spur prominent, quite large. Wings relatively quite large, hyaline, transparent, about two and three-fourths times as long as broad, broadest across first marginal cell, quite acute at apex; first marginal cell much smaller than second; fourth furcal rounded, terminating below apex of wing; radius long; pterostigmal space open, quite long and broad; cubital petiole shorter than discoidal subcosta; basal subcosta shorter than discoidal subcosta; with a distinct plicia connecting base of fourth furcal to radius.

*Male*.—Abdomen moderately long. Genital segment relatively large; claspers long, curved, obtuse at apex; auxiliary claspers shorter, erect, very acute at tip; anal valve very large, as long vertically as genital plate, with a short, broad posterior lobe; pubescence rather short and flocculent.

*Female*.—Genital segment almost as long as rest of abdomen, slender, acute at apex; dorsal plate with a strong convexity dorsad on basal two-thirds, and a tuft of long slender hairs at caudal end of convexity; both plates of almost equal length.

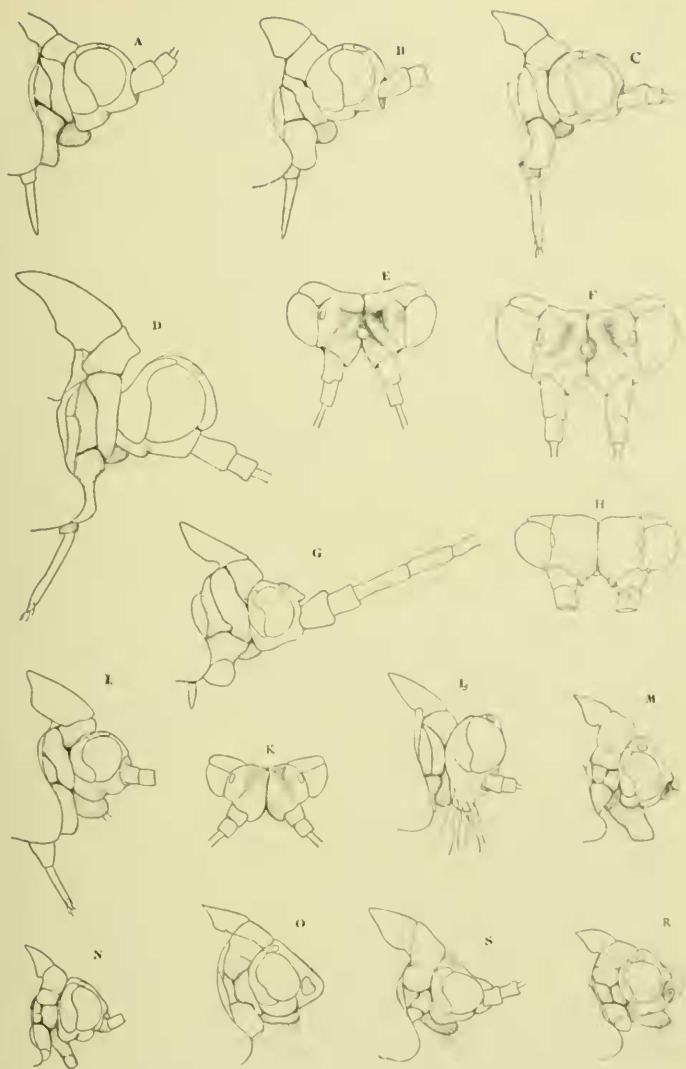


Figure 157. Details of Psyllidæ

A, *Carsidara concolor*; B, *C. mexicana*; C, *C. rostrata*; D, *C. gigantea*; E, *C. rostrata*; E, *C. gigantea*; G, H, *Epicarsa corniculata*; I, K, *Rhinopsylla jalapensis*; L, *Triozoida johsonii*; M, N, *Aphalara calthæ*; O, *Aph. artemisiæ augustipennis*; S, *Aph. communis*; R, *Aph. calthæ maculipennis*.

This species is quite closely related to *Carsidara dugesii* Low, described from Mexico. There is a striking and constant difference, however, in the absence in the Cuban species of the conspicuous stripes and bands of the Mexican form. With the exception of minor differences in the cephalic characters the two species are quite similar.

Described from numerous males and females collected at Havana, Cuba, by C. F. Baker.

*Carsidara gigantea* n. sp.

(Figure 157, D, F; 158, A; 160, A)

Length of body 2.8 mm.; length of forewing 3.8 mm.; greatest width 1.4 mm.; width of vertex between eyes .47 mm.; with eyes .96 mm. General color light yellowish green throughout; distal portions of antennal segments black. Body very large.

Head not deflexed, subglobose, finely punctate, with eyes not quite as broad as thorax. Occipital margin arcuate, scarcely elevated narrowly; discal area with a deep sulcate impression between posterior and anterior ocelli, and a lesser one extending outward on each side from anterior ocellus; anterior ocellus almost in center of vertex on median suture; posterior ocelli well forward, almost opposite anterior ocellus; anterior margin very deeply emarginate at median suture, strongly birostrate; antennæ inserted at apex of rostrate lobes; basal segments very large and long; flagellum very long, slender, filiform; third segment almost twice as long as fourth. Facial cones wanting; antennal bases scarcely swollen. Genæ not prominent. Labrum very small, posterior, inconspicuous; rostrum very long, slender, acute. Eyes large, prominent.

Thorax large, long, broad, punctate, indistinctly striped. Pronotum long, flat on dorsal surface; propleurites very long and large; pleural suture curved, visibly as long as episternum; forecoxae large, mostly visible. Dorsulum very long and broad. Scutum long. Post-tibial spur quite long and large. Wings large, hyaline, shining, about two and three-fourths times as long as broad, broadest across middle, quite acute at apex; first marginal cell much smaller than second; fourth furcal almost as long as second cubital, curved strongly, terminating below apex of wing; radius long; pterostigmal space open, large, long; cubital petiole not quite as long as discoidal subcosta; basal subcosta shorter than cubital petiole.

*Female*—Abdomen large, stout. Genital segment very stout, relatively short, quite acute apically; dorsal plate large, abruptly acute at apex; ventral plate more slender, equal in length to dorsal plate at apex but basally much shorter; pubescence rather dense and long.

Described from three females collected in Granada, Nicaragua, by C. F. Baker.

*Carsidara rostrata* n. sp.

(Figure 157, C, E; 158, B; 160, C)

Length of body 2.4 mm.; length of forewing 3.3 mm.; greatest width 1.1 mm.; width of vertex between eyes .40 mm.; with eyes .76 mm. General color light green. Body moderately large.

Head not deflexed; profile subglobose; with eyes not quite as broad as thorax, punctate. Occipital margin arcuate, scarcely elevated narrowly; discal areas of

vertex deeply impressed with two oblique sulca on each side of median suture, one subtransverse and oblique and the other extending outward from anterior ocellus; anterior ocellus large, on median suture above the apex of excision; posterior ocelli well forward; anterior margin of vertex deeply excised at median suture, making vertex strongly birostrate, antennae inserted at apex of rostrate lobes; basal segments large; flagellum very long, slender, filiform. Facial cones wanting. Genae not prominent. Labrum very small, posterior, inconspicuous; rostrum very long, slender, acute. Eyes large.

Thorax broad, quite long, rather coarsely punctate, not strongly arched. Pronotum relatively long, flat on dorsal surface; propleurites long, prominent; pleural suture visibly as long as episternum; forecoxae quite large, mostly visible. Dorsulum relatively short, broad, broadly rounded on both margins; scutum much longer than dorsulum. Post-tibial spur prominent, quite large. Wings relatively large, hyaline, almost three times as long as broad, quite acute at apex; first marginal cell very much smaller than second; fourth furcal almost as long as second cubital, strongly curved, and terminating below apex of wing; radius long; pterostigmal space closed, quite long and broad; cubital petiole about two-thirds as long as discoidal subcosta, as long as basal subcosta.

*Female*—Abdomen stout. Genital segment almost as long as rest of abdomen, large, upcurved, quite acute; dorsal plate longer basally than ventral; ventral plate strongly upcurved on inferior margin near base; pubescence moderate.

Described from three females collected by C. F. Baker in Chinandega, Nicaragua.

#### *Carsidara mexicana* n. sp.

(Figure 157, B; 158, O; 159, B; 160, E)

Length of body 1.9 mm.; length of forewing 2.9 mm.; greatest width 0.9 mm.; width of vertex between eyes .39 mm.; with eyes .72 mm. General color greenish throughout.

Head not deflexed; profile longer than broad, rounded above; with eyes about as broad as thorax, finely punctate. Occipital margin arcuate, somewhat elevated narrowly, discal area of vertex deeply impressed with an oblique sulcus on each side of median suture extending well forward, and a very inconspicuous impression on each side of anterior ocellus; anterior ocellus on median suture slightly above apex of excision; vertex on anterior margin deeply excised at median suture, strongly birostrate; antennae inserted on apex of rostrate lobes; basal segments large; flagellum very long and slender. Facial cones wanting; antennal bases scarcely swollen. Labrum small, posterior; rostrum very long, slender, acute. Genae slightly swollen. Eyes large.

Thorax scarcely arched, not very broad, quite coarsely punctate. Pronotum relatively long, flat on dorsal surface, extending well down laterally; propleurites long; pleural suture oblique, not as long visibly as episternum; epimeron more or less concealed; forecoxae large, almost entirely visible. Dorsulum relatively quite short, broad, not as long as scutum. Post-tibial spur conspicuous but smaller than in *C. gigantea*. Wings rather small, hyaline, almost three times as long as broad, broadest across second furcal; quite acute at apex; first marginal



cell much smaller than second; fourth fureal almost as long as second cubital, strongly curved and terminating below apex of wing; radius rather short; pterostigmal space closed, rather short and broad; cubital petiole shorter than discoidal subcosta, as long as basal subcosta.

*Male*.—Abdomen moderately stout. Genital segment large; claspers long, strongly curved, obtuse at apex; auxiliary claspers shorter, very acute; anal valve quite large, vertically almost as long as genital plate, with a short, large, posterior lobe; pubescence moderate.

This species resembles quite closely *C. rostrata* Crawford, and may possibly be the male of that species, although this is quite improbable.

Described from one male collected by C. F. Baker at Acapulco, Mexico.

#### *Epicarsa* n. gen.

Head small; vertex flat, quite strongly birostrate; anterior ocellus at base of excision, easily visible from above; posterior ocelli anterior. Labrum small, posterior; rostrum comparatively short. Antennae very stout and thick, relatively short; basal segments largest. Pronotum quite long, flat. Dorsulum long. *Wings* rather rounded at apex, otherwise similar to subfamily type.

*Type of genus: Epicarsa corniculata* Crawford.

#### *Epicarsa corniculata* n. sp.

(Figure 157, G, H; 159, D; 160, F)

Length of body 2.0 mm.; length of forewing 2.9 mm.; greatest width 1.3 mm.; width of vertex between eyes .43 mm.; with eyes .75 mm. General color dark brown or black; head and prothorax jet black; abdomen lighter; genitalia yellowish brown.

Head not deflexed, with eyes almost as broad as thorax, finely punctate; occipital margin straight, emarginate at median suture, not elevated narrowly; vertex discally quite plane, slightly elevated near eyes on postocellar regions, scarcely impressed; very deeply excised on anterior margin at median suture, strongly birostrate; with a conspicuous tuberculous epiphysis near eye over insertion of antennae; postocular portion of occiput not large. Facial cones entirely wanting; antennal bases scarcely swollen; genae not prominent. Labrum very small, posterior, inconspicuous; rostrum relatively rather short and quite stout. Eyes quite large; posterior ocelli reniform, anterior; anterior ocellus in front at apex of excision, visible from above. Antennae not long, very stout and thick; two basal segments very large; third about as long as first two together; scarcely pubescent.

Prothorax quite strongly arched, broad, coarsely punctate. Pronotum long, flat on dorsal surface; pleurites very large and long; pleural suture oblique, almost as long as episternum; forecoxae large, mostly visible. Dorsulum long. Post-tibial spur not very long, conspicuous. *Wings* large, hyaline, shining, less than two and one-half times as long as broad, quite broadly rounded at apex; first marginal cell very much smaller than second; second very large; radial cell short, broad, peculiarly rhomboidal; radius angulate midway, almost contiguous with fureation of second cubital; without pterostigma; cubital petiole shorter than discoidal subcosta; with a prominent black band along third fureal and distal half of radius; a black band along second fureal, and a third on radial subcosta.

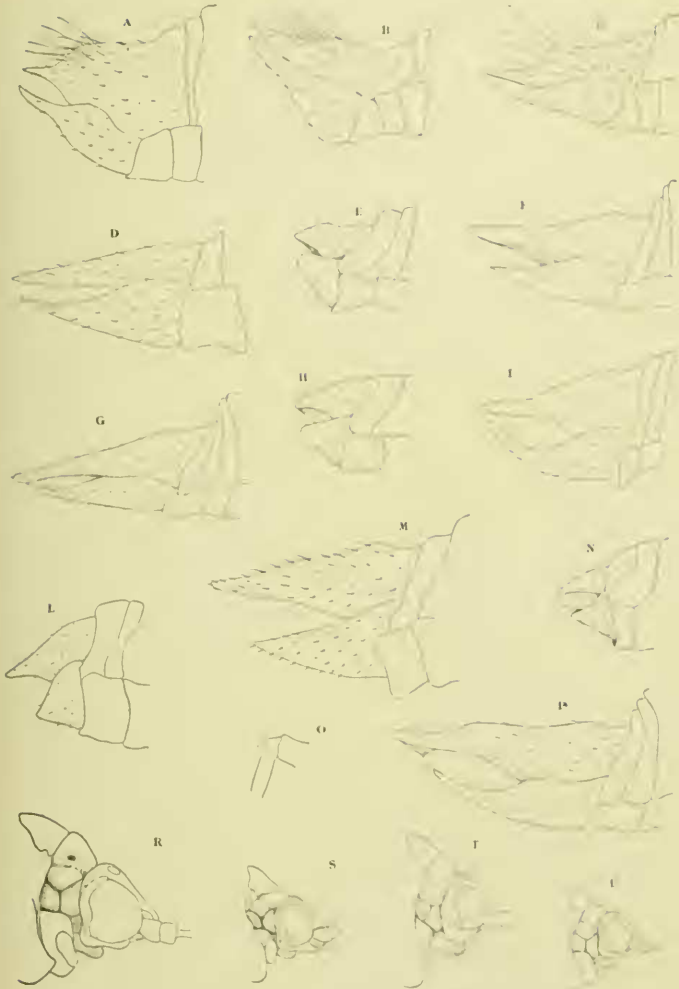


Figure 158. Details of Psyllidae

A, *Carsidara gigantea*; B, C *rostrata*; C, *C. concolor*; D, *Rhinopsylla jalapensis*; E, *Aph. calthæ*; F, *Aph. artemisiæ angustipennis*; G, *Aph. pulchella*; H, *Aph. calthæ*; I, *Aph. minutissima*; L, *Aph. calthæ*; M, *Aph. picta*; N, *Aph. calthæ maculipennis*; O, *Carsidara mexicana* (post-tibial spur); P, *Aph. communis*; R, *Aph. picta*; S, *Aph. nebulosa americana*; T, *Aph. pulchella*; U, *Aph. minutissima*.

*Male*—Abdomen quite stout. Genital segment relatively rather small; claspers short, slender, procurved; anal valve small, simple; auxiliary claspers small or wanting.

Described from one male collected by C. F. Baker at Para, Brazil.

*Rhinopsylla jalapensis* n. sp.

(Figure 157. I, K; 158, D; 159, C; 160, B)

Length of body 2.6 mm.; length of forewing 3.7 mm.; greatest width 1.4 mm.; width of vertex between eyes .40 mm.; with eyes .67 mm. General color greenish brown.

Head not deflexed, finely punctate, with eyes broader than thorax; profile subglobose. Occipital margin arcuate, scarcely elevated narrowly; discal area with a deep sulcate impression extending obliquely toward outer margin of antennæ; postocellar regions well forward, not elevated strongly; anterior margin deeply excised and emarginate at median suture; anterior ocellus at apex of excision, visible from above; antennæ inserted on apex of rostrate lobes; basal segments large; flagellum very long and slender. Facial cones wanting; antennal bases swollen. Genæ prominent. Labrum rather large, posterior; rostrum very long, slender, acute. Eyes large.

Thorax arched, rather narrow, coarsely punctate. Pronotum short, depressed somewhat below dorsulum; propleurites long; pleural suture oblique, not as long visibly as episternum; forecoxæ quite large, mostly visible. Dorsulum long, quite acutely angulated cephalad, almost as long as scutum. Post-tibial spur somewhat reduced, but distinctly present. *Wings* large, hyaline, acute at apex, about two and three-fourths times as long as broad, broadest across first marginal cell; first marginal cell smaller than second; fourth furcal terminating at apex of wing; radius moderately long; pterostigma wanting; cubital petiole wanting.

*Male*—Abdomen rather slender. Genital segment large; claspers large, stout, obtuse at apex; anal valve long, spatulate; pubescence moderate.

*Female*—Genital segment almost as long as rest of abdomen, quite acute and slender; dorsal plate very slightly longer than ventral; pubescence rather sparse.

Described from several males and females collected at Jalapa, Mexico, (D. L. Crawford).

Formerly Known Species of the *Carsidarinae*

*Carsidara dugesii* Low

1886—Neue Beiträge zur Kenntniss der Psylloiden. F. Low, p. 160.

*Carsidara marginalis* Walker

1876—Journ. Proc. Linn. Soc. of London, Vol. X, page 329.

1882—Trans. Ent. Soc. London, XVIII, part III, page 467.

*Tyora congrua* Walker

Ins. Saund Homopt. (Walker) page 111.

1882—Trans. Ent. Soc. of London, Vol. XVIII, part III, page 471.

*Macrohomotoma gladiatum* Kuwayama

1907—Trans. Sapporo Nat. Hist. Soc. Vol. II, page 180.

*Mesohomotoma camphorae* Kuwayama

1907—Loc. cit. page 181.

*Tenaphalara acutipennis* Kuwayama

1907—Loc. cit. page 156.

*Homotoma ficus* Linne1767—Syst. Nat. T. I, part 2, p. 739 (*Chermes ficus*).1844—Iconogr. (Insectes) Guerin, p. 376. (Genus *Homotoma*).

1868—Verhandl. d. k. k. bot.-zool. Ges. Wein, p. 896. (G. v. Frauenfeld).

1878—Ibid. (Low) p. 587.

1882—Ibid. (Low) p. 238.

*Homotoma radiatum* Kuwayama

1907—Trans. Sapporo Nat. Hist. Soc. Vol. II, p. 181.

*Freysuila dugesii* Aleman

1887—La Natureza (2) I, no. 1, pp. 21-26, Tab. III.

1897—Proc. Ent. Soc. of Washington, Vol. IV, p. 196.

*Freysuila dugesii ernstii* Schwarz

1897—Loc. cit.

*Freysuila dugesii cedrelae* Schwarz

1897—Loc. cit.

*Rhinopsylla schwarzii* Riley

1883—Proc. Biol. Soc. of Washington, Vol. II, p. 78.

*Rhinopsylla antennata* Crawford(and variety *proxima* Crawford.)

1910—Pomona Journ. Ent. Vol. III, No. 1, p.—.

*Bactericera perrissii* Puton

1880—Turkestanische Psylloiden (F. Low) p. 264.

*Triozoida* n. gen.

Head strongly deflexed, with eyes almost or fully as broad as thorax. Vertex not punctate; post-ocellar regions elevated; occipital margin narrowly elevated; vertex rounded in front, with anterior ocellus visible only from front. Facial cones posterior, behind antennal insertions, with long pubescence. Labrum short, subglobose. Eyes large, prominent. Antennae inserted in front.

Thorax arched. Pronotum not long, depressed below occiput and more or less below dorsulum, descending cephalad; propleurites together somewhat pyriform; dorsulum ascending, quite acutely rounded cephalad. *Wings* hyaline, *triozine* in form; cubital petiole present or wanting, greatly reduced; subcosta very heavy throughout.

Anal valve of male rather small, rounded, simple.

*Type of genus: Triozoida johnsonii* Crawford.

*Triozoida johnsonii* n. sp.

(Figure 157, L; 159, E; 160, G)

Length of body 2.2 mm.; length of forewing 3.0 mm.; greatest width 1.0 mm.; width of vertex between eyes .48 mm.; with eyes .78 mm. General color dark brown or black; vertex shining black; dorsulum light brown.

Head strongly deflexed, with eyes not quite as broad as thorax, not punctate. Occipital margin arcuate, narrowly elevated over middle; vertex between post-ocellar regions without foveal impressions, rounded toward the front as in *Calophya*; post-ocellar regions distinctly and sharply elevated; anterior ocellus under rounded vertex, somewhat visible from front, more easily from below. Facial cones short, obtuse at apex, vertical, posterior, behind antennal insertions, with very long pubescence distally. Labrum between and behind facial cones, appearing almost a third cone; rostrum moderately long. Eyes very large, prominent, hemispherical as in *Triozoa*, projecting forward beyond margin of vertex. Antennae inserted in front of facial cones, of medium length; flagellum slender.

Thorax arched, more coarsely punctate than head. Pronotum moderately short, descending cephalad below occiput, depressed below dorsulum; longer laterally; propleurites quite large, pyriform; pleural suture curved, extending to tip of episternum; epimeron largely visible; forecoxae relatively small, mostly concealed. Dorsulum long, converging cephalad to a rounded point, spherically triangular. Wings hyaline, shining, long, slender, almost three times as long as broad, broadest across first marginal cell, sharply angulated at apex; first marginal cell smaller than second; fourth furcal terminating at apex of wing; radius short, quite straight; cubital petiole distinctly present but extremely short; subcosta very thick and dark from base to radial margin; with three punctural spots on margin of marginal and cubital cells.

*Male*.—Abdomen slender, rather long. Genital segment relatively not very large; rounded; claspers quite long, simple, subacute at apex, pubescent; anal valve short, broadly rounded, semi-ovate, simple, pubescent.

Described from one male collected at Belize, British Honduras, by J. D. Johnson. This species is very closely related to *Triozoa californica* Crawford, in the structure of the forewing, vertex, head and notum. The subcosta in *T. californica* is large and heavy and the two cubitals, much lighter, are often slightly petiolate. The similarity is so marked as to make these two species congeneric without a doubt.

*Triozoida californica* Crawford.(Syn. *Triozoa californica* Crawford.)

1910—Pomona Journ. Ent. Vol. II, No. 2, p. 234.

*Aphalara* Forst.

Head scarcely deflexed. Vertex quite flat, not rounded, broader than long, with or without distinct foveal impressions or sulca; produced anteriorly into two roundly projecting lobes or epiphyses on each side of median suture. Anterior ocellus under vertex, usually somewhat stalked, and often slightly visible from above. Facial cones entirely wanting. Labrum prominent, elongate or subglobose. Antennae rather short.

Thorax arched. Pronotum terminating laterally in a distinct knob-like enlargement (lateral tubercle of pronotum); propleurites exceedingly short, nearly square, rather depressed. Dorsulum variable in length, usually shorter than scutum. *Wings* broadly rounded at apex, hyaline, maculate, fumate, or spotted; vein furcation distinctly dichotomous; pterostigma wanting.

Anal valve of male with a long acute posterior lobe usually reaching to tip of genital plate, and often with an inferior epiphysis; claspers broadly spatulate to subspatulate at tip.

*Type of genus: Aphalara calthæ* Linne (1760).

It has been necessary to reassign the diagnostic lines of this genus because of the artificiality of the previously accepted lines. After long and careful study of large series of species and specimens, it seems beyond question that the character

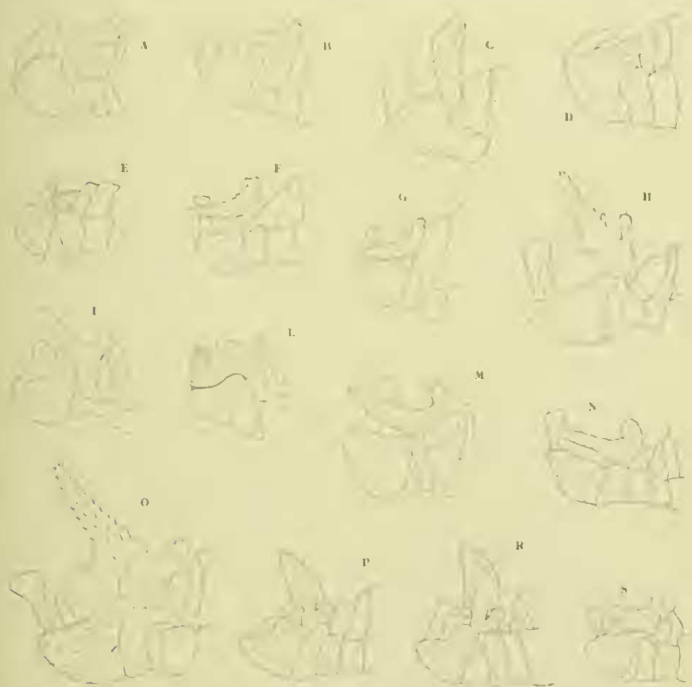


Figure 159. Details of Psyllidæ

A, *Carsidara concolor*; B, *C. mexicana*; C, *Rhinopsylla jalapensis*; D, *Epicarsa corniculata*; E, *Triozoida johnsoni*; F, G, *Aphalara calthæ*; H, *Aph. communis*; I, *Aph. minutissima*; L, *Aph. calthæ maculipennis*; M, *Aph. artemisæ angustipennis*; N, *Aph. pulchella*; O, *Aph. picta*; P, *Aph. nebulosa*; R, *Aph. nebulosa americana*; S, *Aph. calthæ*.

of the propleurites is of prime importance in this genus, as in many others also. This has been entirely ignored or overlooked by other students of this family. As accompanying diagnostic characters the absence of facial cones, and the long posterior lobe of the anal valve of the male are very constant. A recast of European species in accordance with this diagnosis will be necessary but, because only a few of these species are represented in the collections at hand, this cannot be attempted here.

#### Synopsis of Species of Genus *Aphalara*

- A. Labrum very elongate, truncate at apex, descending from face anteriorly. Notum with four more or less distinct light colored stripes. Female genital segment very short. Anal valve of male slightly longer than genital plate. Wings fumate apically.  
*Aphalara calthae* L.
- AA. Labrum not elongate nor truncate, subglobose and more or less appressed to face.
- B. Wings more or less maculate or spotted.
- C. Wings with small brown spots and dots.
- D. Spots distinct and numerous, covering entire surface; wings whitish.
- E. Body small, wings quite white; spots well separated.  
*Aphalara artemisiae* Forst.
- EE. Body larger; wings less white; spots very thickly crowded and often merged.  
*Aphalara artemisiae angustipennis* Crawford.
- DD. Spots indistinct, few, and only in apical half. Wings fulvous.  
*Aphalara communis metzaria* Crawford.
- CC. Wings with maculae, not spotted or dotted.
- D. Labrum quite long, extending forward as far as insertion of antennae.
- DD. Labrum short, not extending forward to insertion of antennae.  
*Aphalara calthae maculipennis* Low.
- E. Profile of head distinctly shorter than broad dorso-ventrally. Wings conspicuously attenuate basally. Anal valve of male with long, tapering lobe posterior; claspers spatulate-clavate.  
*Aphalara pulchella* Crawford.
- EE. Profile of head fully as long as broad or longer. Wings not conspicuously attenuate at base. Anal valve of male conspicuously lanceolate; petiolate at base; claspers abruptly and greatly broadened at tip into transverse plate.  
*Aphalara nebulosa americana* Crawford.
- BB. Wings clear, not maculate or spotted.
- C. Body very small; wings small, white, transversely wrinkled. Profile of head almost round.  
*Aphalara minutissima* Crawford.
- CC. Body large; wings large, not white nor transversely wrinkled.
- D. Body of medium size, yellowish. Dorsum rather flat, not strongly arched. Wings rather slender, first marginal cell long.  
*Aphalara communis* Crawford.

- DD. Body very large, brown. Dorsum quite strongly arched.  
Wings very large, attenuate at base; first marginal cell relatively short.  
*Aphalara picta* Zett

*Aphalara calthae* Linne (1760)

(Figure 157, M, N; 158, E, H, L; 159, F, G, S; 160, I, M)

(Syn. *Aph. polygoni* Först.)

(*Psylla quadrilincata* Fitch, and (?) *Aph. exilis* W. & M.)

Length of body 1.8 mm.; length of forewing 2.6 mm.; greatest width 1.0 mm.; width of vertex between eyes .47 mm.; with eyes .76 mm.; length .34 mm. General color brown, light to dark; vertex usually light; mesonotum with four stripes of light brown, lighter than ground color, two on each side of median line; stripes usually prominent, sometimes inconspicuous or indistinct; abdomen darker, somewhat variegated.

Head slightly deflexed, very coarsely punctate; profile relatively short, about nine-tenths as long as broad; with eyes not quite as broad as thorax. Occipital margin arcuate, centrally elevated slightly; discal area with a marked foveal impression on each side of median suture; emarginate anteriorly at median suture and over each antennal insertion. Facial cones entirely wanting. Genae distinctly swollen. Anterior ocellus under projecting vertex, not visible from above, scarcely stalked. Labrum very prominent, elongate, truncate at apex, yellow.

Thorax broad, somewhat arched, coarsely punctate. Pronotum long, almost as long as dorsulum; with two foveal impressions on each side; propleurites very short, quadrate, depressed; forecoxae mostly concealed. Dorsulum short; with four light colored stripes on dorsal surface. Wings rather small, fumose, darker in apical half than in basal; sides subparallel, about two and a half times as long as broad, broadest across first marginal cell, broadly rounded apically; pterostigma wanting; cubital petiole shorter than discoidal subcosta and shorter than first cubital; marginal cells subequal; claval suture terminating very near to tip of first fureal; apex of wing between radius and fourth fureal.

*Male*—Abdomen strongly convergent caudad. Genital segment moderately large; genital plate about as large as two preceding ventral sclerites; claspers rather short, laterally arched, narrowly spatulate at apex; anal valve large basally, with a long, slender posterior lobe, extending beyond tip of genital plate; axial epiphysis not large.

*Female*—Genital segment short, scarcely longer than anal ventral sclerite; dorsal plate longer than ventral and more acute; ventral plate very obtuse at apex.

Redescribed from one female in the C. F. Baker collection determined by Dr. Franz Low, collected at Stockholm, Sweden, by Frauenfeldt, and from numerous males and females collected in various parts of the United States.

This species was first described by Linne in 1760 from specimens on *Caltha palustris*. Forster later described a species on *Polygonum* as *Aphalara polygoni*, which Low declared after careful comparison to be identical to *Aph. calthae*. The name *Aph. polygoni*, therefore, is synonymical. In 1851 Fitch described a new species in America, naming it *Psylla quadrilincata*. As far as his very brief description goes it compares very closely to the European *Aph. calthae*. According



to C. W. Mally, *Psylla quadrilineata* is identical with *Aph. polygoni*, and therefore is undoubtedly another synonym of *Aph. calthae*.

The species has apparently a world-wide distribution and consequently is subject to more or less minor variation. The color varies from light to dark brown, sometimes almost unicolorated, and often somewhat variegated. The notal stripes, for which Fitch named his *quadrilineata*, are usually very prominent, sometimes scarcely differentiated from the ground color when this is quite light, and sometimes the stripes are almost wanting on the darkest notum; the wings are usually subhyaline, fumose, especially in the apical half, less so in basal half; often they are fulvous-fumate throughout, by transmitted light darker apically; the venation is always conspicuous, though some of the venational characters are variable.

The distribution in the United States as represented in the collections at hand is as follows: In the C. F. Baker collections from Colorado, Arizona, California, Oregon, Washington, Idaho, Louisiana, Illinois, Massachusetts; Colorado (E. S. Tucker), Texas (E. S. Tucker); Canada (C. F. Baker); Mexico (C. F. Baker); Havana, Cuba (C. F. Baker).

From a single female from Aaken, Germany, determined by Dr. F. Low as *Aphalara exilis* W. & M., it seems that it is very probable that this species is synonymical with *Aph. calthae* L.

*Aphalara calthae maculipennis* Low

(Syn. *Aphalara exilis rumicis* Mally)

(Figure 157, R; 158, N; 159, L; 160, T)

This variety was described by F. Low in 1886. As the name indicates, the chief difference lies in the maculation of the wing in the apical portion. This is probably only an intensification of the apical fumose condition in the species. About the only prominent structural difference is in the labrum, which in the variety is relatively short and lying close to the face, not elongate and truncate and extending downward as in the species. The abdomen is often relatively stouter in the female than it is in the species. The notal stripes are less conspicuous. The characters of the labrum and the abdomen were not given by Low, but are quite probably true of his types. Whether or not these characters are of specific value will have to be determined by further study; for the present this will remain as a variety of the species. The size of the insect varies quite widely, as it does also in the species.

Redescribed from specimens in the C. F. Baker collections from Colorado, Arizona, Oregon, Washington, Illinois, Texas (E. S. Tucker). From Mally's description of his variety of *Aph. exilis* W. & M., it seems beyond a reasonable doubt that it is synonymical with Low's variety of *calthae*.

*Aphalara artemisiae* Forster

(Figure 157, O)

(Syn. *Psylla malachitica* Dahlbaum)

Length of body 2.0 mm.; length of forewing 2.6 mm.; greatest width 1.0 mm.; width of vertex between eyes .48 mm.; with eyes .82 mm.; length down center .36 mm. General color greenish white to greenish yellow throughout. Body quite variable in size.

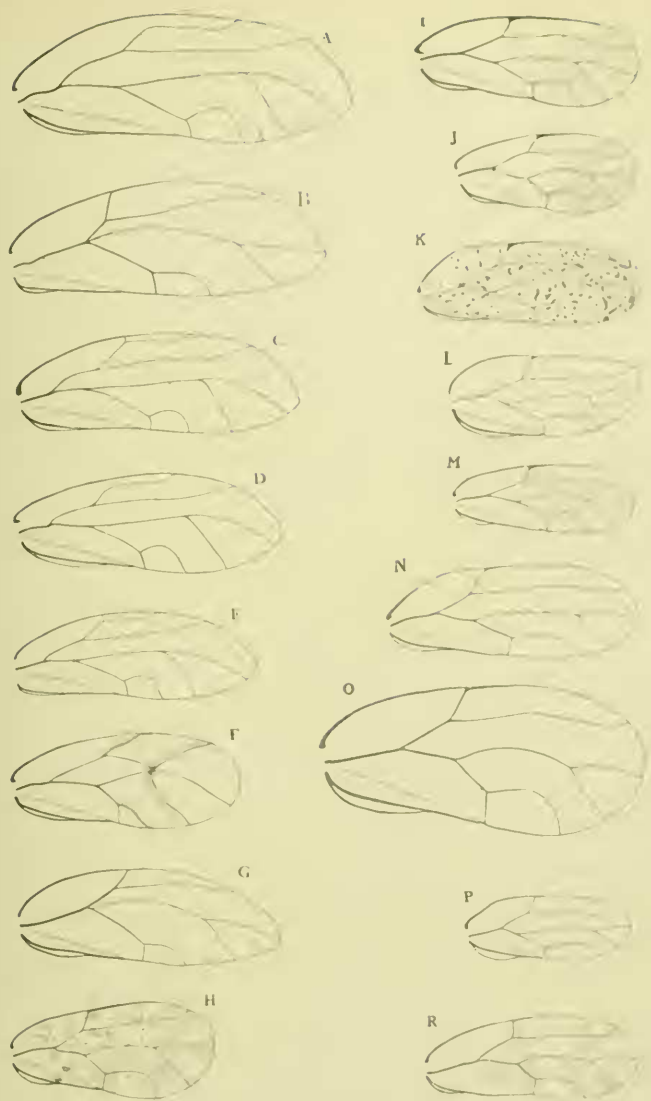


Figure 160. Details of Psyllidæ

A, *Carsidara gigantea*; B, *Rhinopsylla japonica*; C, *Carsidara rostrata*; D, *C. rostrata*; E, *C. mexicana*; F, *Epicaursa corniculata*; G, *Triozoida johnsoni*; H, *Aph. pulchella*; I, *Aph. calthæ*; J, *Aph. calthæ maculipennis*; K, I., *Aph. artemisiæ angustipennis*; M, *Aph. calthæ*; N, *Aph. communis*; O, *Aph. picta*; P, *Aph. minutissima*; R, *Aph. nebulosa americana*.

Head not deflexed, with eyes almost as broad as thorax; profile triangular. Occipital margin arcuate; vertex almost plane, punctate, with a slight impression posteriorly on each side of median suture; anterior margin emarginate broadly at median suture and less so over each antennal insertion. Facial cones entirely wanting. Anterior ocellus somewhat stalked, under projecting vertex, not visible from above. Genæ somewhat swollen. Labrum moderately large, posterior, subglobose from in front, ovoid from side, slightly pubescent. Antennæ short, scarcely longer than width of vertex with eyes; two basal segments large.

Thorax large, broad, coarsely punctate, not strongly arched. Pronotum long, from one to two-thirds times the length of dorsulum; flat on dorsal surface; extending down on both sides to central axis of eye; propleurites short, depressed; fore-coxæ rather small. Dorsulum short, broad, almost as long as scutum. Wings rather small, covered with large, roundish brown dots over entire surface; sides subparallel; more than two and two-thirds times as long as broad, broadest across first marginal cell, broadly rounded apically; pterostigma wanting; marginal cells variable in size; second furcal varying from one-half to three-sevenths the length of radius; fourth furcal one-half to three-sevenths the length of second cubital, terminating at or near tip of wing.

*Male*—Genital segment moderately large, claspers long, laterally arched, not tapering to apex, slightly spatulate; anal valve almost as long vertically as claspers, with a very long, slender, posteriorly projecting lobe on each side, extending to tip of genital segment; pubescence sparse.

*Female*—Genital segment very long, fully as long as rest of abdomen; dorsal plate longer and less acute than ventral; genital pore less than one-fourth the length of dorsal plate.

Redescribed from one male from Pernitz, Austria, determined by Franz Low, and from several males and females from Colorado in the C. F. Baker collection. This species in the United States was named in manuscript *Aphalara utahensis* by Riley. Four English specimens in the collection determined by James Edwards as *Aph. artemisiac* Forst., belong to another species entirely.

The male specimen on which this description is largely based is at one extreme of a large series of variations within the species. The numerous specimens in the collection form a continuous series, from the small and whitish body and whitish wings to forms with much larger and greenish yellow body and yellowish white wings; the dotting and spotting of the forewing, also, is widely but gradually variable from sparsity to great density and running together of dots, often to form maculae. This fact makes the smaller and more sparsely dotted wings appear to the naked eye as almost white, whereas those that are most densely dotted appear yellowish and occasionally light brown. By transmitted light, however, the undotted membrane is always white and corrugated. The structural characters are quite constant throughout the species, with the possible exception of the minor details of wing venation. Although there exists a continuous series as described above, still it seems advisable to separate those most darkly spotted into a more or less distinct variety. Riley, from the material at his disposal, recognized two distinct species, apparently not having a complete series. His manuscript name for the larger and darkly spotted forms was *Aph. angustipennis*.

*Aphalara artemisiae angustipennis* n. var.

(Figure 157, O; 158, F; 159, M; 160, K, L.)

Body larger than in the species, whitish yellow to yellowish; wings yellowish white, often brownish by dense spotting; wing membrane less corrugated. Structurally there is very slight differentiation.

Described from many males and females collected in Colorado by C. F. Baker, determined by E. A. Schwarz as identical to Riley's manuscript form of *Aph. angustipennis*.

*Aphalara communis* n. sp.

(Figure 157, S; 158, P; 159, H; 160, N.)

Length of body 2.7 mm.; length of forewing 3.0 mm.; greatest width 1.1 mm.; length of vertex .36 mm.; width between eyes .52 mm.; with eyes .84 mm. General color greenish yellow; body moderately large.

Head not deflexed, with eyes not quite as broad as thorax, not coarsely punctate. Occipital margin arcuate; vertex discally rather plane, with a shallow, lunate impression posteriorly; discal areas large; anterior margin roundly emarginate at median suture and less so over antennal insertions. Facial cones wanting. Gena quite swollen. Eyes prominent, large; anterior ocellus not visible from above, under vertex, scarcely stalked. Labrum not large, subglobose, slightly pubescent. Antennae inserted on frons under slightly projecting vertex.

Thorax level, scarcely arched, large, broad, not coarsely pubescent, slightly rugulose. Pronotum large, long, prominent, almost as long as dorsulum; pleurites small, short; pleural suture oblique; forecoxae mostly concealed. Dorsulum broad. Wings large, rather long, hyaline and slightly flavous, about two and three-fourths times as long as broad, broadest across first marginal cell, broadly rounded apically; first marginal cell long, more than half as long as radial cell; cubital petiole usually about equal in length to discoidal subcosta, sometimes shorter.

*Male*—Genital segment very large, prominent; claspers long, conspicuously spatulate apically; anal valve large, with long posterior lobe; inferior cusp not large; penis long.

*Female*—Abdomen large, heavy. Genital segment very long; usually longer than rest of abdomen; dorsal plate longer and less acute than ventral; genital pore relatively rather short; pubescence short and sparse.

Described from numerous males and females collected by C. F. Baker at Pagosa Springs, Colorado. Distribution: In the C. F. Baker collections as follows: Colorado, Arizona, California, Nevada, Wisconsin, Louisiana, Alabama; Louisiana (F. C. Bishopp); Wyoming (C. W. Metz).

This species is very closely related to *Aph. nervosa* Forst., a European species. The principal difference is in the wing membrane; in the European species it is conspicuously transversely wrinkled, subhyaline and not flavous; in the American species it is distinctly flavous and scarcely transversely wrinkled.

*Aphalara communis metzaria* n. var.

This variety is separated chiefly upon the presence of brown dots or spots in the distal portion of the forewing, somewhat as in *Aph. angustipennis* Crawford, but

less conspicuous. In the variety as well as in the species there is a variation in the length of the female genital segment, sometimes being very long and occasionally rather short relatively, but always it is nearly or fully as long as rest of abdomen.

Described from one female collected at Banner, Wyoming, by C. W. Metz, and several from Pagosa Springs, Colorado (C. F. Baker).

*Aphalara pulchella* n. sp.

(Figure 158, G, T; 159, N; 160, H)

Length of body 2.0 mm.; length of forewing 2.6 mm.; greatest width 1.2 mm.; length of vertex .29 mm.; width between eyes .46 mm.; with eyes .72 mm. General color black to glossy jet, occasionally brown.

Head not deflexed, with eyes not as broad as thorax, very deeply and conspicuously sculptured rugosely; profile short. Occipital margin arcuate, slightly elevated in center; postocellar regions quite elevated; discal areas with a foveal impression posteriorly; anterior margin quite deeply emarginate or excised at median suture and less so over antennal insertions. Facial cones wanting. Genæ swollen. Labrum rather small, subglobose, slightly pubescent. Antennal bases not swollen. Eyes prominent. Anterior ocellus scarcely stalked, very slightly visible from above. Antennæ short.

Thorax broad, arched, very conspicuously and coarsely sculptured rugosely, more so than on head. Pronotum moderately long, attaining laterad to central axis of eye; pleurites short, depressed; pleural suture erect, arcuate; forecoxae mostly concealed. Dorsulum about twice as long as pronotum, arcuately rounded on both margins, without posterior epiphyses. *Wings* relatively rather large, attenuate basally, maculate more or less over entire surface, especially in distal half; scarcely more than twice as long as broad, broadest across tip of second furcal, very broadly rounded at apex; apex at or near tip of fourth furcal; first marginal cell more than half as long as radial cell; second marginal cell large; cubital petiole scarcely as long as discoidal subcosta; pterostigma almost wanting.

*Male*—Abdomen slender. Genital plate long; profile slender; dorsal margin straight, claspers large, clavate-spatulate, attenuate at base; anal valve large; posterior lobe very long, tapering as long as genital plate; axial epiphysis quite large, obtusely rounded; pubescence sparse.

*Female*—Abdomen stout, short. Genital segment very long, much longer than rest of abdomen, slender, acute; dorsal plate longer and less acute than ventral genital pore relatively short, with a short fringe of hairs on inferior edge of dorsal plate over ovipositor; pubescence sparse.

Described from one male and several females collected in Claremont, California, and San Mateo county, California, by C. F. Baker.

*Aphalara minutissima* n. sp.

(Figure 158, I, U; 159, I; 150, P)

Length of body 1.4 mm.; length of forewing 2.1 mm.; greatest width .8 mm.; width of vertex between eyes .39 mm.; with eyes .70 mm. General color whitish, white to greenish-white.

Head not deflexed, with eyes fully as broad as thorax, rather small, punctate. Occipital margin arcuate somewhat, not elevated narrowly; vertex discally quite plane, with a slight impression in center, and raised somewhat on postocellar regions; anterior margin not very deeply emarginate at median suture, slightly emarginate over antennal insertions. Facial cones entirely wanting; antennal bases not swollen. Genæ not prominent; eyes small; ocelli small; anterior ocellus scarcely stalked, not visible from above. Antennæ short, slender. Labrum relatively rather large, subglobose, pubescent; rostrum short.

Thorax arched, quite broad, coarsely punctate. Pronotum long, about half as long as dorsulum, flat on dorsal surface; pleurites short, depressed; pleural suture erect, shorter than episternum, forecoxae rather large. Dorsulum short, broad; scutum much longer than dorsulum. *Wings* small, not hyaline, subcoriaceous, corrugated, whitish; about two and a half times as long as broad, broadest across first marginal cell, quite broadly rounded at apex; first marginal cell long, more than half the length of radial margin; second marginal cell short, triangular; radius long, curved apically; pterostigma wanting, cubital petiole slightly shorter than discoidal subcosta.

*Male*—Abdomen short. Genital segment relatively large; claspers short, very broad and heavy, subspatulate at apex; anal valve very large; posterior lobe long and slender, longer than genital plate; inferior process small; axial epiphysis quite prominent.

*Female*—Abdomen stout. Genital segment long, stout, subacute at apex; dorsal plate slightly longer than ventral, serrated on inferior margin caudad.

Described from many males and females collected in Ormsby county, Nevada, by C. F. Baker. This species may be known in some collections by the manuscript name of *Aph. occidentalis*.

### *Aphalara picta* Zetterstedt

(Figure 158, M, R; 159, O; 160, O)

(Syn. *Aph. flavipennis* Forst., *Aph. verruca* Thoms. [nec Forst.] )

(*Psylla alpigena* M. D., *Psylla sonchi* Forst.)

Length of body 3.3 mm.; length of forewing 1.2 mm. or less; greatest width 2.0 mm. or less; width of vertex between eyes .64 mm.; with eyes 1.16 mm. General color light yellowish brown to brown. Notum often more or less conspicuously striped longitudinally; abdomen darker; wings flavous. Body very large and stout.

Head scarcely deflexed, large, vertex continuing plane of dorsum; profile triangular; with eyes not as broad as thorax, punctate. Vertex flat, almost plane, with a small fovea in rear center on each side of median suture; occipital margin arcuate, not elevated; postocellar areas scarcely elevated; anterior margin emarginate at median suture, and very slightly so over insertion of antennæ. Facial cones entirely wanting; genæ not swollen. Labrum very small, posterior, subglobose; rostrum short. Eyes relatively very large, covering most of side of head; anterior ocellus under vertex, slightly stalked, not visible from above. Antennæ short, filiform, inserted beneath vertex, laterad.

Thorax large, broad, not strongly arched, coarsely punctate, often striped longitudinally. Pronotum long; lateral tubercle of pronotum large; pleurites small relatively, quadrate, compressed; forecoxae moderately large, largely visible. Dorsulum longer than pronotum, transversely shorter. Wings very large, flavous, subhyaline, a little more than twice as long as broad, broadest across first marginal cell subapically, very broadly rounded at apex; apex at or above termination of fourth furcal; first marginal cell large; second cubital arcuate; radius rather short, curved slightly; cubital petiole usually nearly as long as discoidal subcosta; pterostigma wanting, or nearly so; venation conspicuous.

*Male*—Abdomen moderately large. Genital segment large, prominent, broadest at base; claspers long, spatulate, attenuate at base; anal valve large; posterior lobe long, slender, stiffly pubescent; inferior epiphysis acute, quite long; axial epiphysis long; penis large.

*Female*—Abdomen stout. Genital segment long, almost as long as rest of abdomen; dorsal plate longer and slightly less acute than ventral; pubescence stiff, prominent.

Redescribed from four females from Aaken, Germany, determined by Dr. Franz Low, and from several males and females in the C. F. Baker collection from Colorado. Some of the European specimens are apparently co-types of *Aph. flavipennis* Forster.

#### *Aphalara nebulosa* Zett

(Figure 159, P)

(Syn. *Aph. radiata* Scott, *Aph. gramina* Thoms. [nec Linné.]

Length of body 1.9 mm.; length of forewing 2.6 mm.; greatest width 1.1 mm.; width of vortex between eyes .38 mm.; with eyes .78 mm. General color brown, with light brown to yellowish markings and spots; abdomen darker; vertex lighter on border, dark discally; antennae and legs light.

Head scarcely deflexed, not large, finely punctate; profile subtriangular, rounded in front. Vertex flat, not rounded, somewhat descending, with a shallow fovea on each side in rear center, and a shallow divergent impression extending forward therefrom; occipital margin arcuate, not elevated narrowly; vertex almost black on impressed area, with a yellowish margin all around, narrower in front; black area confluent at median suture; postocellar areas but slightly elevated; anterior margin emarginate at median suture, receding to anterior margin of eye. Facial cones entirely wanting; antennal bases slightly swollen. Labrum small, posterior, subglobose; rostrum short; gena scarcely swollen. Eyes relatively rather large; anterior ocellus beneath vertex somewhat stalked, not visible from above. Antennae quite long, slender, filiform; two basal segments darker colored.

Thorax not strongly arched, broader than head with eyes, punctate. Pronotum not very long, lighter in color than rest of notum; lateral tubercle about as large as episternum, pleurites small, quadrate, compressed; forecoxae small, not extending to lower margin of mesopleurites. Dorsulum relatively rather long, darker than pronotum but lighter than scutum; transversely shorter than pronotum. Wings rather large, subhyaline, maculate apically and less so basally; with a distinct complete band extending from termination of radius across wing diagonally

to second furcal; other macule at apex and near center of wing; a little more broadly rounded at apex; apex at or near termination of fourth furcal; first marginal cell very long; first cubital very short; second furcal not sharply angulate distally; second cubital not strongly arcuate; second marginal cell broad; radius long, straight, except distally; cubital petiole about as long as discoidal subcosta.

*Male*—Abdomen long, brown with light spots. Genital segment prominent, not very large; genital plate with a lateral, basal elevation on each side, much smaller caudad; claspers rather small, slender, with an abruptly and briefly spatulate transverse plate at apex, longer anteriorly than posteriorly; anal valve large; posterior lobe conspicuously lanceolate and petiolate; axial epiphysis short, obtuse; pubescence short, rather dense.

Redescribed from two males from England, determined by James Edwards. This species, although it is European, is included in this paper because of the fact that there is an American form extremely close to it. This has been described as a variety of the European species.

*Aphalara nebulosa americana* n. var.

(Figure 158, S; 159, R; 160, R)

The principal structural differentiation between species and variety lies in the labrum, male genitalia and forewing. The labrum in the variety is distinctly smaller and less conspicuous; the claspers of the male are distinctly larger; transverse plate almost as long as rest of clasper, while in the species it is but slightly more than half the length of clasper. Wing less darkly maculated; apical band not complete across wing. Coloration is quite constant in species and variety.

Described from one male in the C. F. Baker collection from Colorado. This variety may be known in cabinets by the manuscript name of *Aph. epilobii*.

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Note: The name *Trioxa assimilis* Crawford is now changed to *Trioxa flori*, since the former name is preoccupied by *T. assimilis* Flor.

In a paper just received from Dr. Kuwayama of Sapporo, Japan, a genus in Triozinae has been named by him *Epitrioxa*. Since the paper was published in 1909-1910 this name has the right of priority over the genus of the same name published in a previous number of this Journal (Vol. III, No. 1, 1911). The later name, therefore, may be changed now to *Kuwayama* Crawford. Also, a species of *Trioxa*, occurring in Japan has been named by him *Trioxa nigra*. This also antedates the species of the same name described by myself in the Journal of December, 1910. This species may be known hereafter by the name *Trioxa nigrilla* Crawford, instead of *Trioxa nigra* Crawford. The name *Neotrioxa* Crawford is, also, preoccupied by *Neotrioxa machili* Kieffer (1905). My *Neotrioxa* may be known as *Neotrioxella* Crawford.